Lecture 4

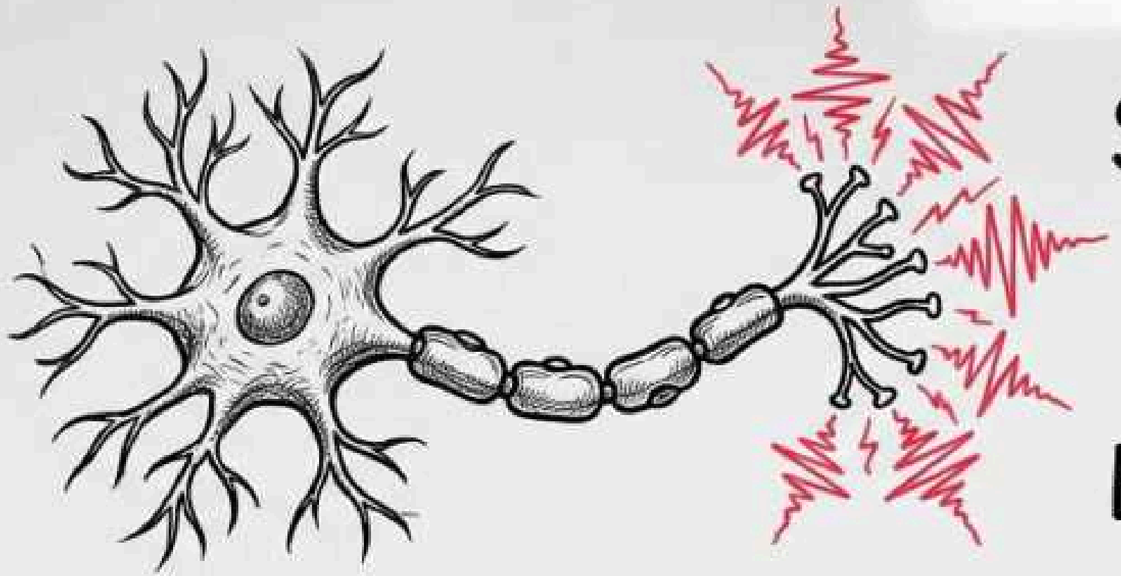
MED 546 B LECTURE 4: Epilepsy and Blackouts



Seizures → Syncope → Treatment → Living with Epilepsy

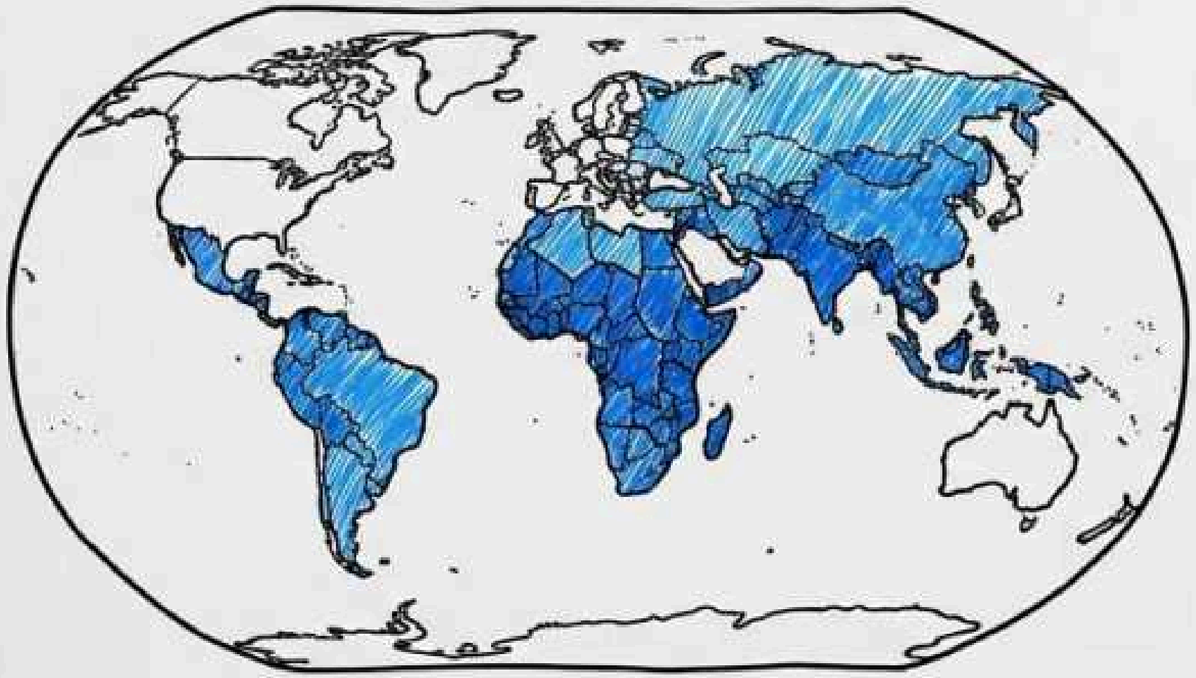
At a glance: What a seizure is, types of seizure, diagnosing epilepsy, the causes of blackouts, syncope, treatment, status epilepticus, and living with epilepsy.

¶ 4.1



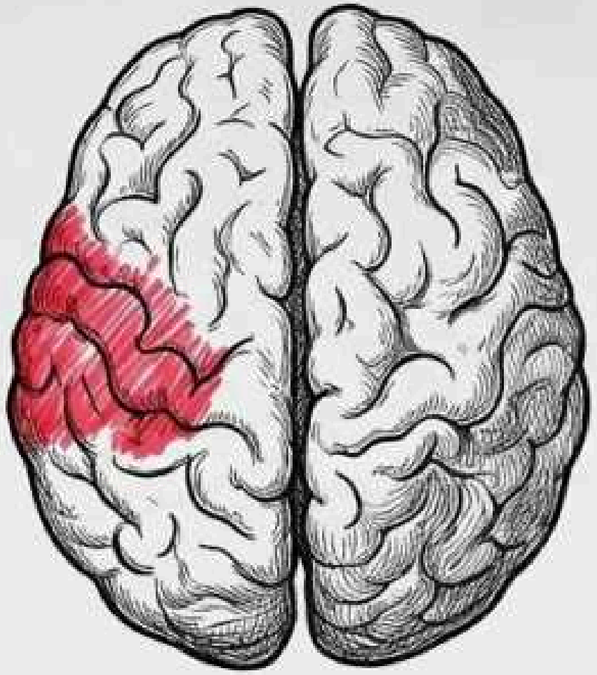
Seizure = Sudden, Temporary Disturbance of Brain Function
↳ Abnormal Electrical Activity

Epilepsy = Tendency for Recurrent, Unprovoked Seizures



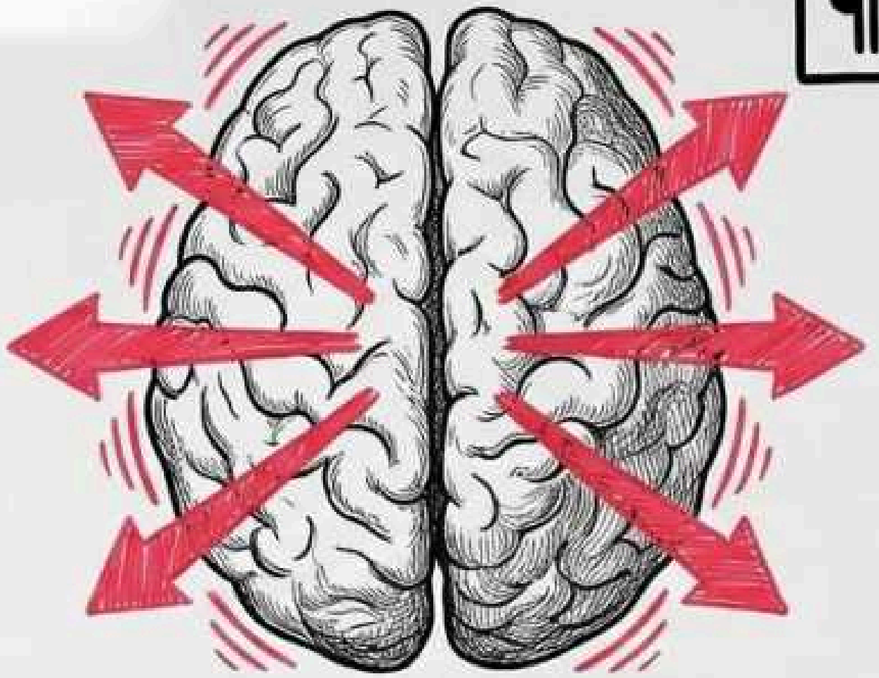
Global Impact

- 50 Million cases worldwide.
- 4/5 of affected individuals live in low- and middle-income countries.
- Critical Gap: Many in LMIC receive no treatment.



FOCAL SEIZURES

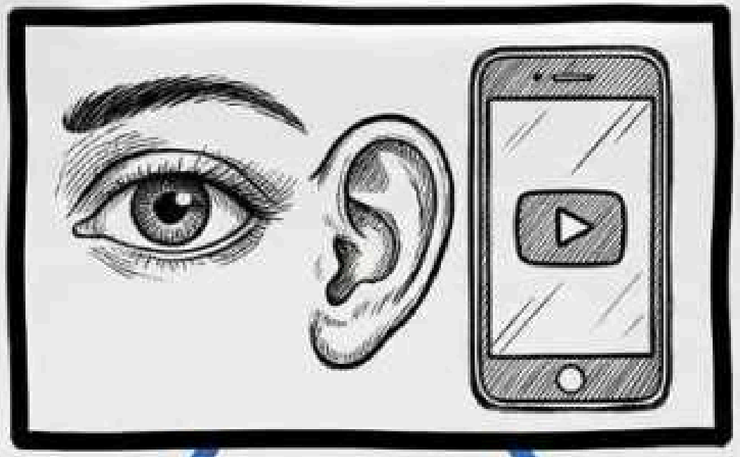
- Begin in one area of the brain.
- Symptoms depend on the area affected:
  - Jerking of one limb
  - Strange feeling or smell
  - Altered awareness with automatic movements (e.g., lip smacking)



GENERALISED SEIZURES

- Involve both sides of the brain from the start.
- Tonic-clonic: Stiffening + rhythmic jerking + loss of consciousness.
- Absence: Brief blank spells (common in children).

¶ 4.3

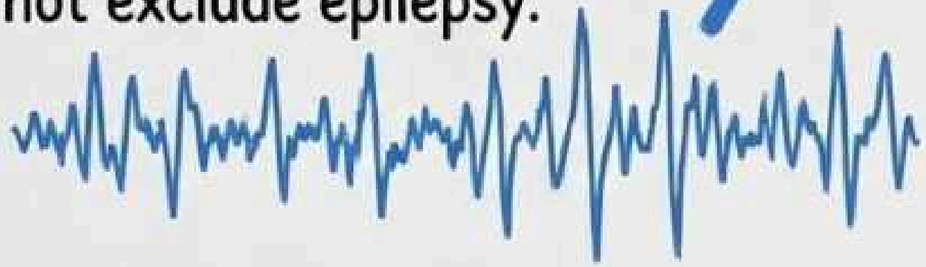


PRIMARY DRIVER:
Patient & Witness History
+ Smartphone Video

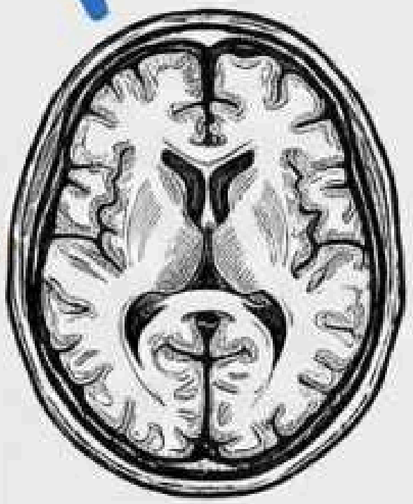
Crucial for a clear description of events.

SUPPORTIVE: EEG
Shows patterns that support diagnosis & epilepsy type.

NOTE: A normal EEG does not exclude epilepsy.



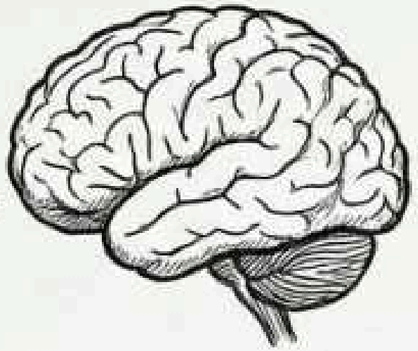
STRUCTURAL: MRI



Looks strictly for structural causes.

¶ 4.4

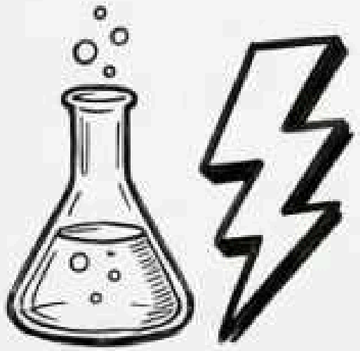
UNDERLYING CAUSES



- Genetic factors
- Brain injury
- Stroke or Brain tumours
- Infections
- Developmental brain abnormalities
- Dementia (in older people)

In many people, no cause is found.

PROVOKED TRIGGERS

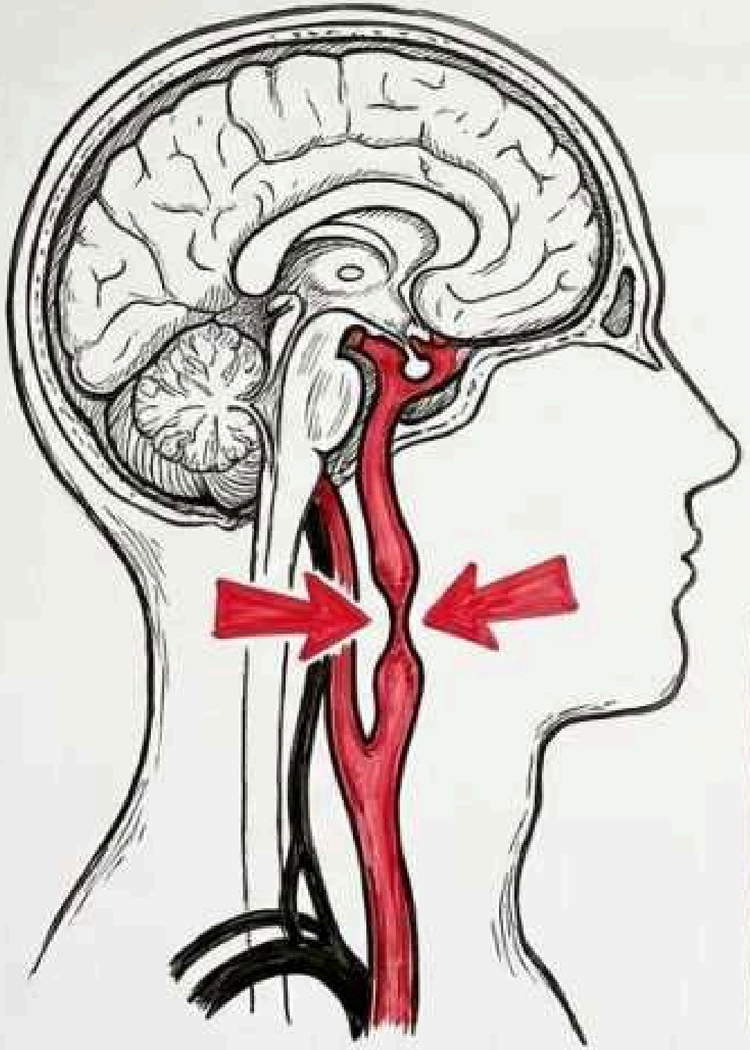


- Alcohol withdrawal
- Low blood sugar or sodium
- Drug toxicity
- Severe sleep deprivation

CLINICAL RULE: Provoked Seizure is NOT necessarily Epilepsy.

¶4.5

Transient Loss of Consciousness (TLOC) = Syncope (Fainting)



Mechanism: Temporary fall in blood flow to the brain.

TRIGGERS:
Long standing
Pain
Sight of blood
Heat

→

WARNINGS:
Feeling hot, sweaty, light-headed

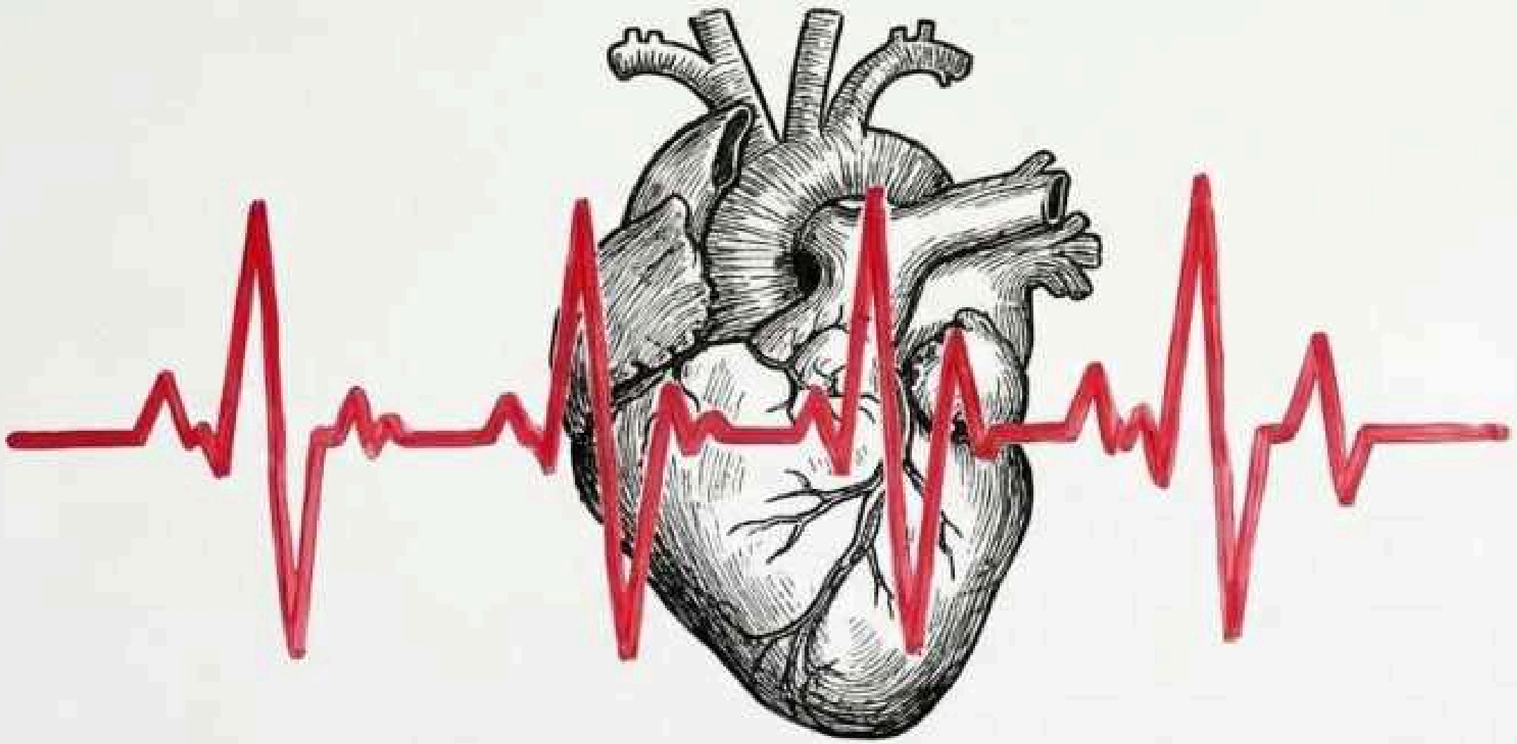
→

THE FAINT
(Vasovagal Syncope)

* **DIAGNOSTIC TRAP:** Brief jerks can occur during a faint and be mistaken for a seizure. Not every blackout is a seizure.

CARDIAC SYNCOPE

¶ 4.6



RED FLAG WARNINGS

- ☑ Blackout during exercise
- ☑ Blackout while lying down
- ☑ Accompanied by palpitations
- ☑ Family history of sudden death at a young age

Caused by heart rhythm problems or structural heart disease.
Less common, but highly dangerous.

MANDATORY RULE: Every patient with a blackout must have an ECG.

¶ 4.7



DISSOCIATIVE / FUNCTIONAL SEIZURES

- **Nature:** Real and involuntary, BUT they are NOT caused by abnormal electrical activity in the brain.
- **Presentation:** Resemble epileptic seizures. Highly common in specialist clinics.
- **Gold Standard Diagnosis:** Video EEG recording of a typical event can distinguish them from epilepsy.

Antiseizure Drugs = INEFFECTIVE

↓

Psychological Therapies = INDICATED

EPILEPSY TREATMENT: A STEPPED APPROACH

¶ 4.8

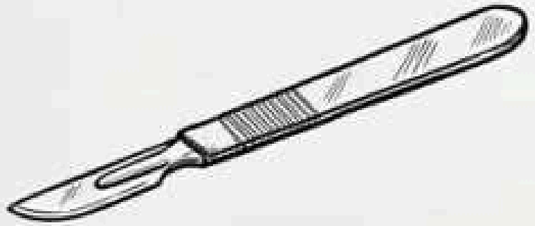


FIRST-LINE: Antiseizure Medicines

- Controls seizures in ~2/3 of people.
- Choice depends on: Epilepsy type, side effects, other medicines.

RED ALERT:
Valproate + Pregnancy = Causes birth defects and developmental problems.

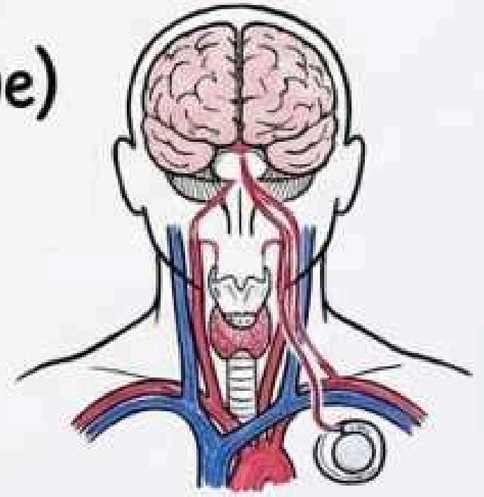
ADVANCED OPTIONS (If seizures continue)



Epilepsy Surgery
(Removes the area where seizures begin; can be curative)



Dietary Therapy



Nerve Stimulation

¶4.9



SEIZURE > 5 MINS
OR
REPEATED SEIZURES W/O RECOVERY
=
STATUS EPILEPTICUS
(Absolute Medical Emergency)

Threat: Can cause brain damage and death.

Immediate Protocol → 1. Benzodiazepines (Midazolam into the cheek OR Lorazepam into a vein) → 2. Follow with further medicines if needed



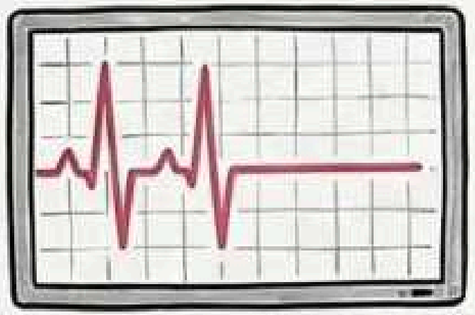
DRIVING

Restricted. Requires a legally set seizure-free period before driving resumes.



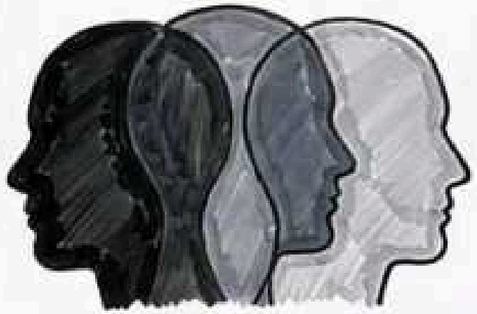
SAFETY MEASURES

Modify daily habits to reduce risk (e.g., taking a shower rather than bathing).



SUDEP

Sudden Unexpected Death in Epilepsy. Rare, but the leading cause of epilepsy-related death. Good seizure control reduces this risk.



SOCIETY

Stigma about epilepsy remains common in many societies, requiring ongoing support and management.

¶4.11

1. Diagnosis relies mainly on history and a witness account.

2. Syncope is the commonest blackout cause (Cardiac must never be missed!).

3. Functional seizures are common & psychological.

4. Most epilepsy is controlled with medicines.

5. Status epilepticus is a medical emergency.

Next Lecture:
Multiple Sclerosis and Movement Disorders